

# COURSE STRUCTURE AND SYLLABUS FOR B. TECH DEGREE IN ELECTRONICS ENGINEERING (2024 Batch)



RAJIV GANDHI INSTITUTE OF PETROLEUM TECHNOLOGY JAIS, AMETHI  
(RGPT JAIS, AMETHI)

## Credit Distribution for B. Tech Electronics Engineering 2024 Batch

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| Category                           | Range          | Proposed   |
|------------------------------------|----------------|------------|
| Humanities and Social Science (HU) | 22             | 22         |
| Science (IS)                       | 70-90          | 80         |
| Institute Engineering (IE)         | 40-70          | 57         |
| Engineering Drawing, Workshop (EP) | 18-24          | 13         |
| Language & Management (LM)         | 18-24          | 20         |
| Departmental Core (DC)             | 145-190        | 146        |
| Departmental Elective (DE)         | 30-75          | 36         |
| Open Elective (OE)                 | 15-20          | 18         |
| Project/Industrial Visit (DP)      | 20-50          | 48         |
| <b>Total Credits</b>               | <b>440-490</b> | <b>440</b> |

**Course Structure:**  
**(B. Tech Electronics Engineering)**  
**2024 Batch**

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**First Year Odd Semester**

| Course Code | Course/Subject                                   | L | T | P   | Cr        |
|-------------|--------------------------------------------------|---|---|-----|-----------|
| PY111       | Classical Physics (IS)                           | 3 | 1 | 0   | 11        |
| CY121       | Inorganic & Physical Chemistry (IS)              | 3 | 1 | 0   | 11        |
| MA111       | Real Analysis & Calculus (IS)                    | 3 | 1 | 0   | 11        |
| ECE102      | Fundamentals of Electronics Engineering (IE)     | 3 | 1 | 0   | 11        |
| ECE101      | Electronics Engineering Work Practices (EP)      | 1 | 0 | 2   | 5         |
| ME131       | Workshop Practices (EP)                          | 0 | 0 | 3   | 3         |
| ECE102L     | Fundamentals of Electronics Engineering Lab (IE) | 0 | 0 | 2   | 2         |
| PY111L      | Physics Lab (IS)                                 | 0 | 0 | 2/2 | 1         |
| CY111L      | Chemistry Lab (IS)                               | 0 | 0 | 2/2 | 1         |
|             | <b>Total Credits</b>                             |   |   |     | <b>56</b> |
| LM101       | Basic English* (L)                               | 1 | 2 | 0   | 7         |
| HU101       | Universal Human Values (HU)                      | 1 | 1 | 0   | 5         |

\*Basic English course to be taken by student on recommendation after Diagnostic Test

**First Year Even Semester**

| Course Code | Course/Subject                      | L | T | P   | Cr        |
|-------------|-------------------------------------|---|---|-----|-----------|
| PY121       | Modern Physics (IS)                 | 2 | 1 | 0   | 8         |
| MA121       | Differential Equations (IS)         | 3 | 1 | 0   | 11        |
| CH161       | Engineering Thermodynamics (IE)     | 3 | 1 | 0   | 11        |
| CS101       | Computer Programming (IE)           | 3 | 1 | 0   | 11        |
| CS101L      | Computer Programming Lab (IE)       | 0 | 0 | 2   | 2         |
| ECE103      | Solid State Electronic Devices (IE) | 3 | 1 | 0   | 11        |
| ME121       | Engineering Graphics (EP)           | 0 | 0 | 3   | 3         |
| PY121L      | Physics Lab (IS)                    | 0 | 0 | 2/2 | 1         |
| CY121L      | Chemistry Lab (IS)                  | 0 | 0 | 2/2 | 1         |
|             | <b>Total Credits</b>                |   |   |     | <b>59</b> |
| HU102       | Community Internship (HU)           | 1 | 1 | 0   | 5         |

## Second Year Odd Semester

| Course Code | Course/Subject                                             | L | T | P | Cr        |
|-------------|------------------------------------------------------------|---|---|---|-----------|
| MA211       | Linear Algebra & Complex Analysis (IS)                     | 2 | 1 | 0 | 8         |
| ECE221      | Digital Circuits and Systems (DC)                          | 3 | 1 | 0 | 11        |
| ECE213      | Electromagnetic Fields Theory (DC)                         | 3 | 1 | 0 | 11        |
| CH213       | Material Engineering and Device Fabrication Practices (IE) | 3 | 0 | 0 | 9         |
| ECE201      | Network Analysis & Synthesis (DC)                          | 3 | 1 | 0 | 11        |
| CS211       | Data Structures (IE)                                       | 3 | 0 | 0 | 9         |
| CS211L      | Data Structures Lab (IE)                                   | 0 | 0 | 2 | 2         |
| ECE221L     | Digital Logic Design Lab (DC)                              | 0 | 0 | 2 | 2         |
|             | <b>Total Credits</b>                                       |   |   |   | <b>63</b> |

## Second Year Even Semester

| Course Code | Course/Subject                                       | L | T | P | Cr        |
|-------------|------------------------------------------------------|---|---|---|-----------|
| MA231       | Statistical Methods and Data Analysis (IS)           | 2 | 1 | 0 | 8         |
| ECE232      | Analog Circuits and Systems (DC)                     | 3 | 1 | 0 | 11        |
| ECE231      | Control Systems (DC)                                 | 3 | 1 | 0 | 11        |
| ECE202      | Fundamentals of Electrical Engineering (DC)          | 2 | 1 | 0 | 8         |
| ECE211      | Signals and Systems (DC)                             | 3 | 1 | 0 | 11        |
| MA221       | Numerical Methods (IS)                               | 2 | 1 | 0 | 8         |
| ECE232L     | Analog Circuits and Systems Lab (DC)                 | 0 | 0 | 2 | 2         |
| ECE223L     | Workshop on FPGA Architecture & HDL Programming (DC) | 0 | 0 | 2 | 2         |
|             | <b>Total Credits</b>                                 |   |   |   | <b>61</b> |

## Summer Term

| Course/Subject                                    | L | T | P  | Cr |
|---------------------------------------------------|---|---|----|----|
| Industrial Training/Summer Project (DP) (4 Weeks) | 0 | 0 | 11 | 3  |

### Third Year Odd Semester

| Course Code | Course/Subject                            | L | T | P | Cr        |
|-------------|-------------------------------------------|---|---|---|-----------|
| ECE311      | Communication Engineering - I (DC)        | 3 | 1 | 2 | 13        |
| ECE312      | Digital Signal Processing (DC)            | 3 | 1 | 2 | 13        |
| ECE323      | Instrumentation and Measurements (DC)     | 3 | 1 | 0 | 11        |
| ECE323L     | Instrumentation and Measurements Lab (DC) | 0 | 0 | 2 | 2         |
|             | Department Elective – 1 (DE)              | 3 | 0 | 0 | 9         |
|             | <b>Total Credits</b>                      |   |   |   | <b>48</b> |

| Departmental Elective (DE - 1) |                                                  |                                    |
|--------------------------------|--------------------------------------------------|------------------------------------|
| ECE332                         | Introduction to Time-Varying Electrical Networks | Microelectronics/<br>Communication |
| ECE334                         | Memory Circuits and System                       |                                    |
| ECE326                         | Embedded Systems and IOT                         |                                    |
| ECE322                         | System Verilog for Design and Verification       |                                    |
| ECE333                         | Analog IC Design                                 |                                    |
| ECE342                         | Digital IC Design                                |                                    |
| ECE328                         | Linear Integrated Circuits Design                |                                    |
| ECE314                         | Stochastic Process                               |                                    |
| EEV351                         | Fundamentals of Electric Vehicles (DC)           |                                    |
| EEV331                         | Sensors and Actuators                            |                                    |

### Third Year Even Semester

| Course Code | Course/Subject                      | L | T | P | Cr        |
|-------------|-------------------------------------|---|---|---|-----------|
| PC101       | Professional Communications (L)     | 2 | 1 | 0 | 8         |
| ECE316      | Communication Engineering - II (DC) | 3 | 1 | 2 | 13        |
| ECE338      | VLSI Design (DC)                    | 3 | 0 | 0 | 9         |
| EE323       | Advanced Design and Simulation (DC) | 1 | 0 | 2 | 5         |
|             | Department Elective – 2 (DE)        | 3 | 0 | 0 | 9         |
|             | Department Elective – 3 (DE)        | 3 | 0 | 0 | 9         |
|             | <b>Total Credits</b>                |   |   |   | <b>53</b> |

| Departmental Elective (DE - 2) and (DE - 3) |                               |                   |
|---------------------------------------------|-------------------------------|-------------------|
| ECE336                                      | VLSI Data Conversion Circuits | Microelectronics/ |

|        |                                                |               |
|--------|------------------------------------------------|---------------|
| ECE337 | CMOS RFIC Design                               | Communication |
| ECE324 | Advanced Digital Design                        |               |
| ECE335 | IC Fabrication                                 |               |
| EEV333 | Digital Control                                |               |
| ECE414 | Advanced Digital Signal Processing             |               |
| ECE319 | Video and Image Processing                     |               |
| EEV301 | Vehicular Communication System                 |               |
| MA323  | Optimization Methods and Applications          |               |
| ECE431 | Advanced Field Effect Devices                  |               |
| ECE433 | Electronics System Design                      |               |
| ECE434 | Semiconductor Optoelectronic Devices           |               |
| ECE412 | VLSI Digital Signal Processing                 |               |
| ECE403 | Antennas and Propagation                       |               |
| ECE318 | Modern Coding Theory                           |               |
| ECE402 | Industrial Automation                          |               |
| ECE345 | Mixed Signal circuit Design                    |               |
| ECE343 | PMIC Design                                    |               |
| ECE339 | Integrated Circuits for Wireless Communication |               |
| ECE340 | VLSI Design-for-Test                           |               |
| ECE341 | Biomedical Signal Processing                   |               |
| ECE315 | Optical Communication                          |               |

### Summer Term

| Course/Subject                                    | L | T | P  | Cr |
|---------------------------------------------------|---|---|----|----|
| Industrial Training/Summer Project (DP) (6 Weeks) | 0 | 0 | 12 | 5  |

### Fourth Year Odd Semester

| Course Code | Course/Subject                                   | L | T | P | Cr        |
|-------------|--------------------------------------------------|---|---|---|-----------|
|             | Department Elective – 4 (DE)                     | 3 | 0 | 0 | 9         |
| HU331       | Organizational Psychology (HU)                   | 2 | 0 | 0 | 6         |
| MT5100      | Principle of Economics (M)                       | 2 | 0 | 0 | 6         |
|             | Open Elective – 1 (OE)                           | 3 | 0 | 0 | 9         |
|             | Employability Skills and Industry Readiness (EP) | 0 | 0 | 2 | 2         |
|             | <b>Total Credits</b>                             |   |   |   | <b>32</b> |

| <b>Departmental Elective (DE - 4)</b> |                                        |                                    |
|---------------------------------------|----------------------------------------|------------------------------------|
| ECE436                                | Introduction to Nano Electronics       | Microelectronics/<br>Communication |
| ECE437                                | Advanced High Speed Devices & Circuits |                                    |
| ECE438                                | Micro-Electromechanical Systems (MEMS) |                                    |
| ECE411                                | Data Communication Networks            |                                    |
| ECE401                                | Microwave Engineering                  |                                    |
| ECE413                                | Wireless Communication                 |                                    |
| ECE416                                | Optical Networks                       |                                    |
| ECE417                                | Information Theory                     |                                    |
| ECE435                                | Flexible Electronics and Green Energy  |                                    |
| ECE418                                | Satellite Communication                |                                    |

### Fourth Year Even Semester

| Course Code | Course/Subject                            | L | T | P  | Cr        |
|-------------|-------------------------------------------|---|---|----|-----------|
| EEV420      | B.Tech. Project (Internal/External) (DP)  | 0 | 0 | 40 | 40        |
|             | Open Elective- 2 (OE)                     | 3 | 0 | 0  | 9         |
| MT5405      | Foundations of Management (M)             | 2 | 0 | 0  | 6         |
| HU313       | Sociology of Industry & Work Culture (HU) | 2 | 0 | 0  | 6         |
|             | <b>Total Credits</b>                      |   |   |    | <b>61</b> |